Social Networks and Knowledge Sharing in Communities of Practice:
A Developing Societies' Perspective

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Abstract
This article explores the idea of using social networks for knowledge transfer and sharing in the context of Communities of Practice (CoPs). The current Covid-19 pandemic has made such research crucial to study the benefits of digital platforms. The notion of a knowledge ba and its implementation over a digital platform is a cybernetic one with voluminous prior research. This article briefly reviews the extant literature on social media and knowledge sharing in order to prescribe a research agenda. The specific research question investigates if and how knowledge sharing can take place across virtual communities and digital platforms to bridge inequalities through growth and development opportunities.

Keywords: Knowledge for Development, Research Agenda, Virtual CoPs.

Introduction

The Research Objective addressed in this paper is to identify, develop and share knowledge in virtual communities as part of lifelong learning for development and hence to reduce inequality. Prior research has revealed the influence of social network to leverage in internal and external sources of knowledge and sharing by providing interactive and collaborative technologies, which improve the value of relational capital (Majchrzak et al. 2013; Leonardi 2014; Panahi et al. 2012; Ma and Chan 2014). Digital technology would facilitate the communications between users by bridging the gap between tacit and explicit knowledge over online social network services. Virtual Communities of Practice (VCoPs) as a group of people who interact and communicate with each other as well as learn together and using social media, potentially crossing location and political boundaries aim to match appropriate interests while creating a sense of commitment and membership (Frank et al., 2017). Hence, social media as an online platform set of content, activities, and channels to provide open access and unlimited participation through the web would be assessed as a platform for knowledge sharing. The interactive system of learning with user forums to support community interactions between givers and receivers of knowledge, as well as immediate feedback to assessments and assignments address such a platform. This study aims to develop a type of social media to improve the effectiveness of search and communication in knowledge sharing within developing societies. In particular, the first question is does this technology in the digital era go a step further and contribute to effective knowledge transfer, sharing and creation?

SECI model by Nonaka (2000) (Socialization, Externalization, Combination, and Internalization) for organizational learning that examines the constant conversion of knowledge between tacit and explicit forms reflects the importance of socialization in knowledge sharing. Socialization is the process of transforming new tacit knowledge which is difficult to recognize, context-specific and often personal like world views, mental models and mutual trust, this type of knowledge can be obtained only via

shared experience, such as getting together, informal social meetings or communicating in the same environment between people in a shared physical or virtual.

The competitive advantage of a society is dependent on its knowledge reserve and even more on its ability to mobilize knowledge for productive work (Chandrasekar and Sharma, 2010). A knowledge society need not be one wherein every individual has multiple skills across domains, but rather it is a community where individuals of each particular ability are networked a way that allows them to leverage the capabilities of others, with culture and context playing critical roles.

The phenomenon of knowledge disparity in three different levels of human development in societies has been perused by Chandrasekar and Sharma (2010). They show striking knowledge disparity within low development societies. We seek to illustrate that socialization via social media would play a crucial role in bridging knowledge disparity through visual and virtual "face-to-face" communication. The impact on low HDI societies would connect people with the low level of knowledge to the higher levels of knowledge within VCoPs through helping to find each other as well as facilitating the search and accessibility of knowledge stock. Consider an example where people in public places (knowledge) with different levels and types of knowledge do not have social connection with others with know-how and expertise and hence have no access such tacit knowledge, while the combination of their thought would lead to knowledge creation. Hence, social networks would match their knowledge and needs leading to value creation, growth, development and empowering the less-included with digital innovation. The idea is that users could ask their queries and solve their problems easily by finding and contacting domain experts with solutions.

Review of Literature

In this section, we first give a description of knowledge for development. Thereafter, we summaries the potential factors that influence knowledge sharing and then explore the new opportunities that social media bring to knowledge co-creation and sharing. We will seek to illustrate the correlation between three parameters of social media, knowledge sharing and sustainable development with a glance on the 10th Sustainable development goals titled reducing inequality (See Fig.1).

Figure 1. The impact of social networks on sustainable development by value creation

A.   Knowledge for development

The World Development Report (1998) conceded that knowledge, not capital, plays a key role in sustained growth of economy as well as human well-being. An integral part of the Organization for Economic Co-operation and Development (OECD)'s mission is boosting better strategies for better lives in developing societies. One part of the OECD synthesis report (2013) has focused on Knowledge-based capital as new sources of growth and considered it as intangible assets.

Knowledge for development aims to boost knowledge creation in developing societies in the fields of education, health, economy, infrastructure, and other issues. Information and communication technologies are creating great possibilities for transferring, testing and sharing information, knowledge, and hence wisdom. Laszlos (2002) acknowledge that knowledge management can make a meaningful contribution to the creation of human and social capital that are essential for sustainable development.

We will study on the role of knowledge for development because it would lead to provide relevant knowledge-what and knowledge-how needed for development issues by encouraging people to ger actively together to express their individual and communities' knowledge and in understanding know-what, know-how and know-why as a hierarchy of knowledge described by Bhatt (2001).

B.   Knowledge Sharing with Social Networks

As discussed before, this study focuses on knowledge sharing through a digital social network. The current section postulates what factors influence knowledge sharing by conducting a systematic literature review. Ordonez (2016) in her article emphasized the importance of collaborating in terms of knowledge flow and human resource system. Huang and Chin (2018) also consider T-shaped skills as

cognitive skills embodied in people who are crucial to knowledge transfer. They suggest that the core ability most associated with knowledge transfer is T-shaped skills. T-shaped skills as a type of cognitive skills involving both deep technical skills (the vertical axis of the "T") and broad general skills (the horizontal axis of the "T"). Individuals who have T-shaped skills are called as T-shaped people. T-shaped people have both extraversion and introversion skills so that express their expertise and broad knowledge to people in other disciplines. Hence, collective knowledge is the tacit portion of interpersonal and common knowledge held by all team members. To achieve collective knowledge, individuals should understand it (Madhaven and Grover, 1998; Zhao et al., 2004). According to Miao et al. (2016), the more diverse experience individuals and organizations have, the better they can accumulate knowledge that is potentially valuable. They show the importance of compatibility of knowledge through the value of experience.

Accessibility in terms of access to knowledge stock but not applying knowledge is considered by Lin and Lee (2005). Ordonez (2016) also emphasize accessible knowledge because a single existence of knowledge anywhere in the organization does not lead to competitive advantages. She states the knowledge would be a valuable organizational resource only if it is accessible. Chen and McQueen (2010) consider accessibility inside the structure of knowledge transfer and type of knowledge transfer. We can divide the knowledge transfer into two groups of structure and unstructured. Structured knowledge transfer means a formal, planned and intentional transfer process., while, unstructured knowledge transfer is an informal, unplanned and automatic transfer process (Chen and McQueen, 2010). Their research findings illustrate that tacit and complicated knowledge would be more likely transferred through unstructured, informal and personal knowledge transfer approaches while explicit knowledge would be more likely transferred by formal and structured transfer approaches.

Sedighi et al. (2018) describe Material Reward as a non-monetary benefit that improves knowledge sharing performance. They also consider reciprocity as a decisive factor for knowledge sharing in the private, group and public level of knowledge exchange. They illustrate a perceived benefit that could boost participants' engagements in knowledge sharing is reciprocity due to the expectation that members will receive knowledge in return, in the future. Dezdar (cited by Lin, 2007) believes that when participants are confident in their ability to perform a particular task, they would have knowledge-self-efficacy which encourages them to share knowledge with their group. This parameter has a positive effect on knowledge sharing. (Dezdar, 2017; Sedighi et al., 2018). Dezdar (2017) also contends that there is a positive relationship between humility and knowledge-sharing behavior. The key parameters influencing knowledge sharing are postulated in Fig. 2 and will be probed further in section 3 in terms of their relationships with social network characteristics.

collaborating	T-shaped Skills	Collective knowledge
compatibility	Accessibility	Transfer Structure
motivation	Humility	Interpersonal Trust
	Reputation	

Figure 2. 10 parameters for effective knowledge sharing

C.   Social Media as Knowledge Ba's

Nonaka, Toyama & Konno (2000) proposed the idea of a ba as a physical or virtual meeting place for knowledge exchanges and diffusion. Majchrzak et al. (2013) have studied in the context of performing a particular task to explore the interplay between the technologies of social media and people. They offered a theory that social media provides four affordances which represent different ways to get involved in knowledge sharing communication: meta-voicing, triggered attending, network-informed associating, and generative role-taking. To understand how people are engaged in knowledge

communication, these forms of engagement make and improve different theoretical mechanisms. The enterprise social networking site has made a grounded theory of communication visibility, which leads to improve the awareness of who knows what and whom through message transparency and network translucence as two interdepend mechanisms proposed by Leonardi (2014, 2021). He also discusses the critical importance of this emerging theory of communication visibility that could play a key role in the knowledge economy.

Panahi et al. (2012) addressed social media concepts and characteristics with the requirements of tacit knowledge creation and sharing. The results of this theoretical investigation illustrated that social media have abilities to fulfill some of the main characteristics of tacit knowledge sharing. Moreover, to explore the factors influencing knowledge sharing behavior, Ma and Chan (2014) focus on the theory of belonging and the intrinsic motivation of altruism. The results of their work shows that perceived online attachment motivation and perceived online relationship commitment have positive, direct, and significant effects on online knowledge sharing. Focusing on how interpersonal relationships lead to such sharing in the social media environment, they seek to explore the motivational factors that influence knowledge sharing among participates.

We contend that the opportunity of effective knowledge sharing brought by social media has yet to be studied by focusing on new solutions for knowledge disparity in developing societies based on design science research methodology that will be explained in the next section. We will study in the field of using social media to advocate and raise knowledge on sustainable development practices that can be spread and scaled up worldwide.

Research Method and Design

When we compare natural sciences with design science we will understand natural and social sciences attempt to realize reality, while design science seeks to create things that serve human goals (Simon, 1996). Design Science Research (DSR) is a well-known paradigm in information system research. This methodology has been developed and used by many researchers (Hevner et al. 2004; Hevner 2007; Peffers et al. 2008; Drechsler and Hevner 2011; Sein et al. 2011; Gregor and Hevner 2013; Vaishnavi and Kuechler, 2015; Baskerville et al. 2018). Due to its features in providing the solution for known or unknown problems in a technical context, the DSR approach is deemed appropriate and suitable for our purpose.

Hevner et al. (2004) in their earliest paper on DSR, pointed out that two paradigms characterize much of IS behavioral science and design science research. When we need to explain or predict human or organizational behavior, the behavioral science paradigm that seeks to develop and verify theories would be appropriate. On the other hand, the design-science paradigm by creating new and innovative artifacts intends to reduce the barrier of human and organizational capabilities. Both paradigms are basically used in the IS discipline, positioned as it is at the confluence of the strategy, people, process and technology. In the design-science paradigm, researchers should achieve the domain of a problem as well as its solution and these are attained in the creating and application of the designed artifact. Considering the emphasis on valuable artifacts, DSR brings practical relevance while scientific rigor will be achieved by the extraction of design theories to IS research (Baskerville et al., 2018). It is also possible to combine both genres of inquiry which contribute to both knowledge bases in research projects. (Drechsler and Hevner, 2011). Different attitudes in artifact description are likely to be presents in a variety of ways, and depending on the type of artifact and the research features there are probably different design practices. As the application of social systems is different from information systems The format for displaying an IT product artifact also will be different from that used with a socio-technical artifact (Niederman and March 2012, Gamji et al, 2021).

According to Gregor and Hevner (2013), knowledge start-points (e.g., maturities) are important due to the support of a clearer understanding of the project objectives and new contributions to be achieved in DSR Knowledge Contribution Framework. In each quadrant, the contextual starting points of the research in terms of problem and solution have been briefly described. The knowledge foundations include: i) Invention: New Solutions for New Problems, ii) Improvement: New Solutions for Known Problems, iii) Exaptation: Known Solutions Extended to New Problems and iv) Routine Design: Known Solutions for Known Problems. In this study, knowledge sharing via social networks seems to be in the Improvement category, since developed VCoPs are considered new opportunities for knowledge sharing.

We seek to achieve the solution for effective knowledge sharing and creation in developing societies and understanding of our problem domain by building and evaluating of a design artifact.
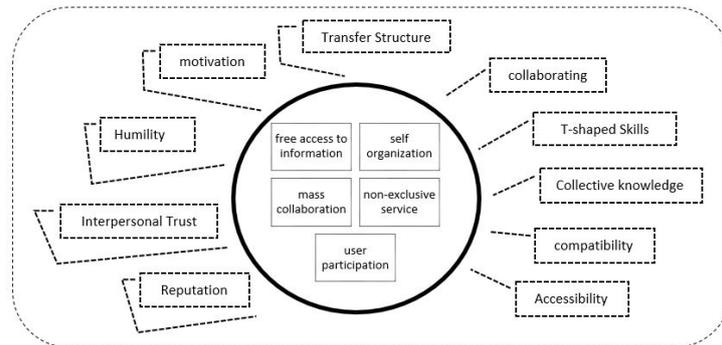

Figure 3. conceptual model of a social network for knowledge sharing

This project would be implemented in two phases:

1) Customizing a vCoP using social network for knowledge sharing in a developing societies context

2) Validation of the design artifacts for knowledge sharing in developing societies

For the first phase, to construct a new media to achieve the VCoPs performance in terms of utility, trust, contribution, and sense of belonging (Frank et al, 2017) for the aim of knowledge sharing reviewed in section 2.2, five parameters will be suggested to be applied including free access to information, self-organization, mass collaboration, non-exclusive services, and user participation (Sabo et al., 2009). These are illustrated in figure 3 as a conceptual model of a social network for the aim of knowledge sharing.

Table 1. principles for customizing a social network for knowledge sharing in developing societies

Principles	Domains
Digital Literacy	Information literacy Teaching and learning Communication Safety Technical proficiency Research (Beetham, 2017)
Digital Infrastructure	Human Development Device and networks Applications Community Involvement (Sharma et al, 2018)
Language and Culture	English Skills fit-for-purpose (socially, culturally, and targeted to the needs and abilities Knowledge Exchange
Socio-economic Status	Education Income Occupation

The next phase would be specializing the social network for developing societies based on their culture and some probable technical limitations. This study discusses features of social networks and looks at them from a developing countries' perspective to conclude that due to a complicated set of conditions (access, language, computer literacy among others) common in developing countries, how can we make a viable solution for knowledge sharing for a large proportion of people in these areas of the world. Hence, developing countries' perspectives studied by Liyanagunawardena et al. (2013) will be perused to understand the principles of customizing a social network for knowledge sharing in developing societies. As listed in table 1, these principles are Digital Literacy, Infrastructure, Language and Culture, and Socio-Economic Status.

Research Agenda and Concluding Remark

We shall study the relationship between the fit of social networks and knowledge sharing, in terms of the effectiveness of knowledge searching, socialization, and creation. We seek to identify the fundamental factors that control knowledge creation and explore the role of social networks. The contribution of this theoretical paper is to analyze the role of social networks on knowledge sharing. Scholars believe that the most valuable knowledge is often be tacit and its transfer to help value creation is complex. Thus, after distribution we will require a longer term relationship between the givers and receivers. This is why customized social networks are critical; because they support socialization externalization, combination and internalization, eventually leading to value creation. (See figure 4).
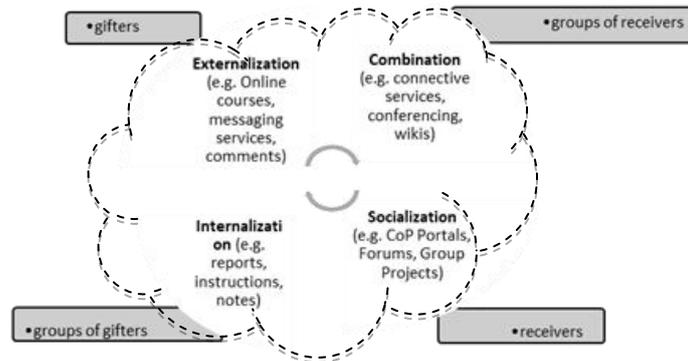

Figure 4. Knowledge Co-Creation Ba on a Cloud

Figure 4. Knowledge Co-Creation Ba on a Cloud
We intend to analyze the function of socialization as well as the effect of accessibility and connection which results in knowledge sharing leading to value creation. Hence, after the construction of new media based vCoPs we aim to validate this with field experiments, guided by the "experimentation" method of DSR evaluation and validation proposed by Vaishnavi & Kuechler (2015). The Field Experiments would help inform better decisions and become long-term laboratories for large-scale, longitudinal, randomized controlled trials (RCTs). Individuals are selected from a population to perform various SECI tasks. The intervention is randomly assigned after participants have been assessed for eligibility and recruitment.

Table 2.**The evaluation of customized social network for knowledge sharing**

Hypothesis	Criteria	Outcome
How might knowledge in an online community be recognized and traced through network interactions?	searching	Number of people who find the answer to a specific problem
How likely is a person joining a social network to meet experts with knowledge and skills which could satisfy his/her requirements?	communication	The frequency of chatting over the network
How likely is a person to co-create new knowledge with other members?	value creation	The number of tangible / intangible products
How does social networks facilitate the accessibility of the knowledge stocks and provide the essential tacit knowledge at the best time and place?	accessibility	The frequency of use from different locations at different times
How may social networks be used for knowledge sharing in developing societies with technical, social and infrastructural limitations?	usability	The popularity of new media within studied developing society

Using iterative prototyping of re-configured off-the-shelf platforms such as Canvas and Slack, carefully selected criteria (Conrath and Sharma, 1992) as well as outcome (Conrath and Sharma, 1993) measurements are collected to test the design hypotheses listed above. The research road map is summarised in table 2. To validate searching, communication, accessibility and usability in the customized social network we may perform experiments in randomize groups of people in a developing society with controlled access, usage, participation and values dimensions. In such a manner, we hope to develop a design theory for vCoPs in the domain of knowledge sharing for development.

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